

**IN THE CLAIMS:**

1. (Previously Presented) An apparatus for calculating an offset value for a current sensor of a magnetic flux detection type, comprising:
  - a determining device which determines whether calculation of the offset value is permitted based on a current value detected by the current sensor, the determining device making the determination such that calculation of the offset value is permitted when the current value detected by the current sensor is switched from a negative value to a positive value, or from a positive value to a negative value and when an absolute value of the current value is within a predetermined range, wherein the predetermined range is based on the characteristics of a core of the current sensor; and
  - a calculating device which calculates the current value detected by the current sensor as the offset value when calculation of the offset value is permitted by the determining device.
2. (Canceled).
3. (Previously Presented) The apparatus according to claim 1, wherein the predetermined range is changed according to a change in a temperature of the current sensor.
4. (Currently Amended) An apparatus for calculating an offset value for a current sensor of a magnetic flux detection type, comprising:
  - a determining device which determines whether calculation of the offset value is permitted based on a current value detected by the current sensor, the determining device making the determination such that calculation of the offset value is permitted when the current value detected by the current sensor is switched from a negative value to a positive value, or from a positive value to a negative value; and
  - a calculating device which calculates the current value detected by the current sensor as the offset value when calculation of the offset value is permitted by the determining device,

wherein the determining device makes a determination such that calculation of the offset value is permitted when the current value detected by the current sensor is switched from a negative value to a positive value, or from a positive value to a negative value, and when a state where an absolute value of the current value is within a predetermined range is continued for a predetermined time,

wherein one of the predetermined range and the predetermined time is changed according to a change in a temperature of the current sensor.

5. (Canceled)

6. (Original) The apparatus according to claim 1, further comprising:  
a determining device which determines whether the current sensor is not being supplied with electric power, wherein the calculating device calculates the current value detected by the current sensor as the offset value when it is determined that the electric sensor is not being supplied with electric power by the determining device, and also calculation of the offset value is permitted by the determining device.

7. (Original) The apparatus according to claim 6, wherein the current sensor and the apparatus for calculating an offset value for the current sensor are mounted on a vehicle, and the determining device determines that the current sensor is not being supplied with electric power when an ignition of the vehicle is turned OFF.

8. (Previously Presented) A method for calculating an offset value for a current sensor of a magnetic flux detection type, comprising:

a determination step in which a determination is made such that calculation of the offset value is permitted when a current value detected by the current sensor is switched from a negative value to a positive value, or from a positive value to a negative value, and when an absolute value of the current value is within a predetermined range, wherein the predetermined range is based on the characteristics of a core of the current sensor; and

a calculation step in which the current value detected by the current sensor is calculated as the offset value when calculation of the offset value is permitted in the determination step.

9. (Canceled).

10. (Previously Presented) The method according to claim 8, wherein the predetermined range is changed according to a change in a temperature of the current sensor.

11. (Currently Amended) A method for calculating an offset value for a current sensor of a magnetic flux detection type, comprising:

a determination step in which a determination is made such that calculation of the offset value is permitted when a current value detected by the current sensor is switched from a negative value to a positive value, or from a positive value to a negative value; and

a calculation step in which the current value detected by the current sensor is calculated as the offset value when calculation of the offset value is permitted in the determination step,

wherein, in the determination step, determination is made such that calculation of the offset value is permitted when the current value detected by the current sensor is switched from a negative value to a positive value or from a positive value to a negative value, and when a state where an absolute value of the current value is within a predetermined range is continued for a predetermined time,

wherein one of the predetermined range and the predetermined time is changed according to a change in a temperature of the current sensor.

12. (Canceled)

13. (Original) The method according to claim 8, further comprising:

a determination step in which it is determined whether the current sensor is not being supplied with electric power, wherein, in the calculation step, the current value detected by the current sensor is calculated as the offset value, when it is determined that the current sensor is not being supplied with electric power in the determination step, and also calculation of the offset value is permitted in the determination step.

14. (Original) The method according to claim 13, wherein the current sensor is mounted on a vehicle, and, in the determination step, it is determined that the current

**PATENT**

**Serial No: 10/727,588**

**Docket No: 10517-201**

sensor is not being supplied with electric power when an ignition of the vehicle is turned OFF.